

A new species of *Thaumastella* with notes on the morphology, biology and distribution of the two southern African species (Heteroptera: Thaumastellidae)

by

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Thaumastella elizabethae, a third species belonging to the family Thaumastellidae, is described and figured. Aspects of the morphology (e.g. the stridulatory apparatus and the arrangement of trichobothria) of the two southern African species are compared, discussed and illustrated with scanning electron micrographs. The chromosome numbers of the two species are given and the presence of m-chromosomes reported. The distribution and biology of the species are briefly discussed.

It is concluded that the systematic position of *Thaumastella* could only be decided on after a re-evaluation of certain taxa within the Cydnidae.

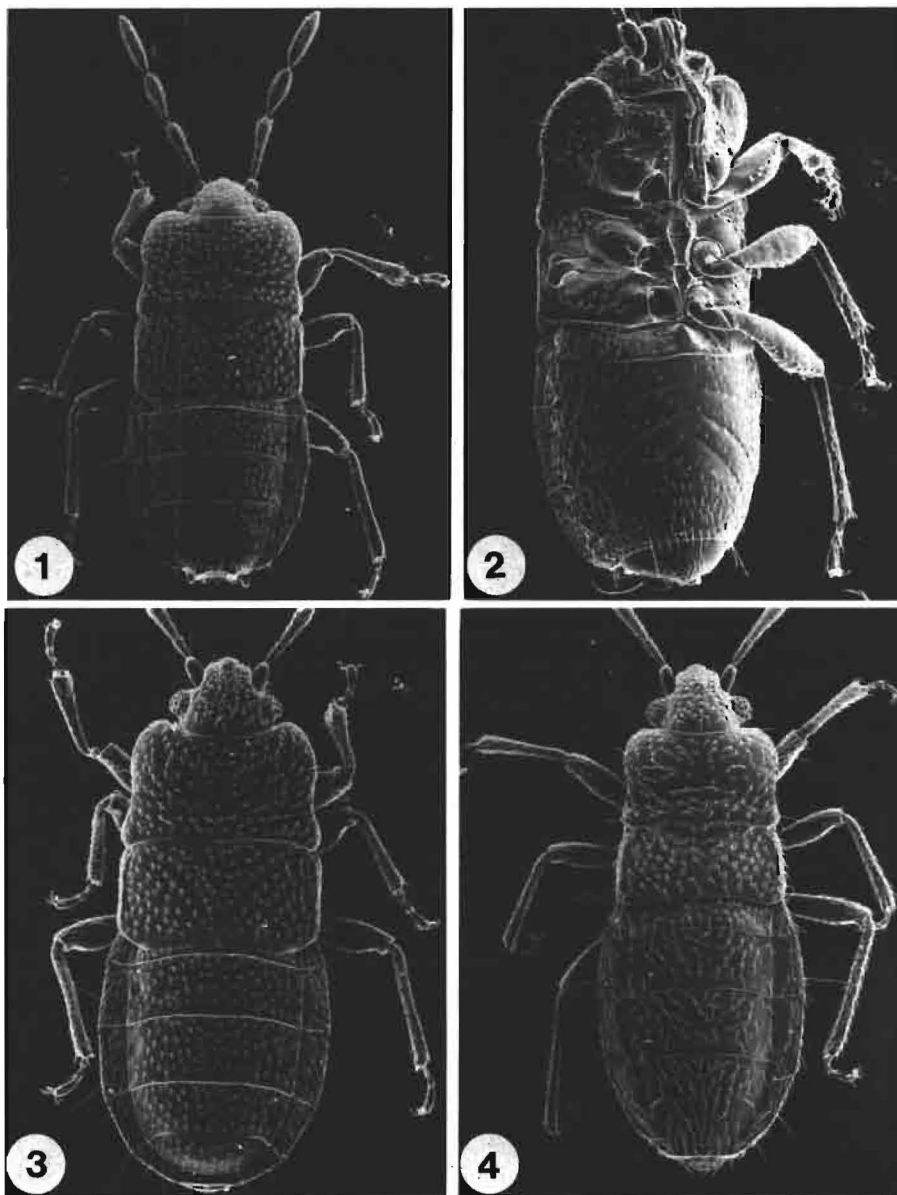
INTRODUCTION

The Thaumastellidae is a small family which until the present contained only two species, *Thaumastella aradoides* Horvath from North Africa and the Middle East and *T. namaquensis* Schaefer & Wilcox from Namaqualand in South Africa. The family is of interest because it appears to be primitive in the Pentatomoidea (Stys 1964; Schaefer & Wilcox 1971). The higher classification of *Thaumastella* has a history of uncertainty – refer to Schaefer & Wilcox (1971) for a summary of this uncertainty – but its placement in the Thaumastellidae, close to the Cydnidae, seems correct. Dolling (1981) considered it a subfamily of the Cydnidae.

Collecting trips to Namaqualand during recent years yielded many specimens of *T. namaquensis* as well as specimens of an undescribed species which is described here as *T. elizabethae*. Observations on the biology of the species made whilst collecting them are also reported here together with morphological aspects revealed by scanning electron- and light microscopic studies.

MATERIAL and METHODS

Specimens were collected and stored in 75% ethanol until they were mounted or prepared for examination by scanning electron microscope (SEM). Whole specimens and parts were prepared for SEM examination by cleaning them with an ultrasonic sound cleanser before air drying and coating them with gold. They were examined with the aid of a Hitachi Model S-450 SEM using an acceleration voltage of 15kV or 20kV.



Figs 1-4. Scanning electron photomicrographs of *Thaumastella* species. 1-3. *T. elizabethae* **spec. nov.** 1. Male paratype, dorsal view. 2. Male, ventrolateral view. 3. Female paratype, dorsal view. 4. *T. namaquensis* Schaefer & Wilcox, dorsal view of female.

Measurements in Table 1 were taken by projecting an image of the insect on a digitizer tablet of a Kontron image analyzer computer by means of a Zeiss SV8 stereomicroscope fitted with a camera lucida. The measurements were then taken by using a cross-hair cursor. The correct scale was obtained by projecting the image of a stage micrometer (under the same magnification and focus setting used for the insects) on the digitizer tablet and measuring a specific length. Special care was taken to ensure that the structure that was being measured lay on a horizontal plane in order to minimize errors of measuring three dimensional structures by means of two dimensional images.

The chromosome numbers were determined by making squash preparations of the testes of various individuals. Because of the small size of the insects it was impossible to dissect out the testes of unfixed individuals. Males were thus collected, anaesthetized with ethyl acetate, cut into two through the thorax (in order to assist the penetration of the fixative) and fixed in a freshly prepared solution of 2,5 : 1 :: methanol : propionic acid. The fixed individuals were stored in the fixative in a refrigerator ($\pm 4^{\circ}\text{C}$) for from a few days to several months until preparations were made. The preparations were made by dissecting the testes out and squashing them in a 1% solution of carmine in 45% acetic acid according to the conventional method.

The material on which this study is based will be housed in the following institutions which are referred to in the text by the accompanying abbreviation.

- AMGS – Albany Museum, Grahamstown, South Africa.
- AMNH – American Museum of Natural History, New York, USA.
- BMNH – British Museum (Natural History), London, England.
- BMSA – National Museum, Bloemfontein, South Africa.
- CASC – California Academy of Sciences, San Francisco, California, USA.
- DHJS – Private collection of author, Pretoria, South Africa.
- MRAC – Musée Royal de l'Afrique Centrale, Tervuren, Belgium.
- NMSA – Natal Museum, Pietermaritzburg, South Africa.
- TMSA – Transvaal Museum, Pretoria, South Africa.

Thaumastella elizabethae spec. nov., Figs 1–3, 5, 7–9, 11–16, 19–20, 22–23, 25–26, 28–32, 35–36.

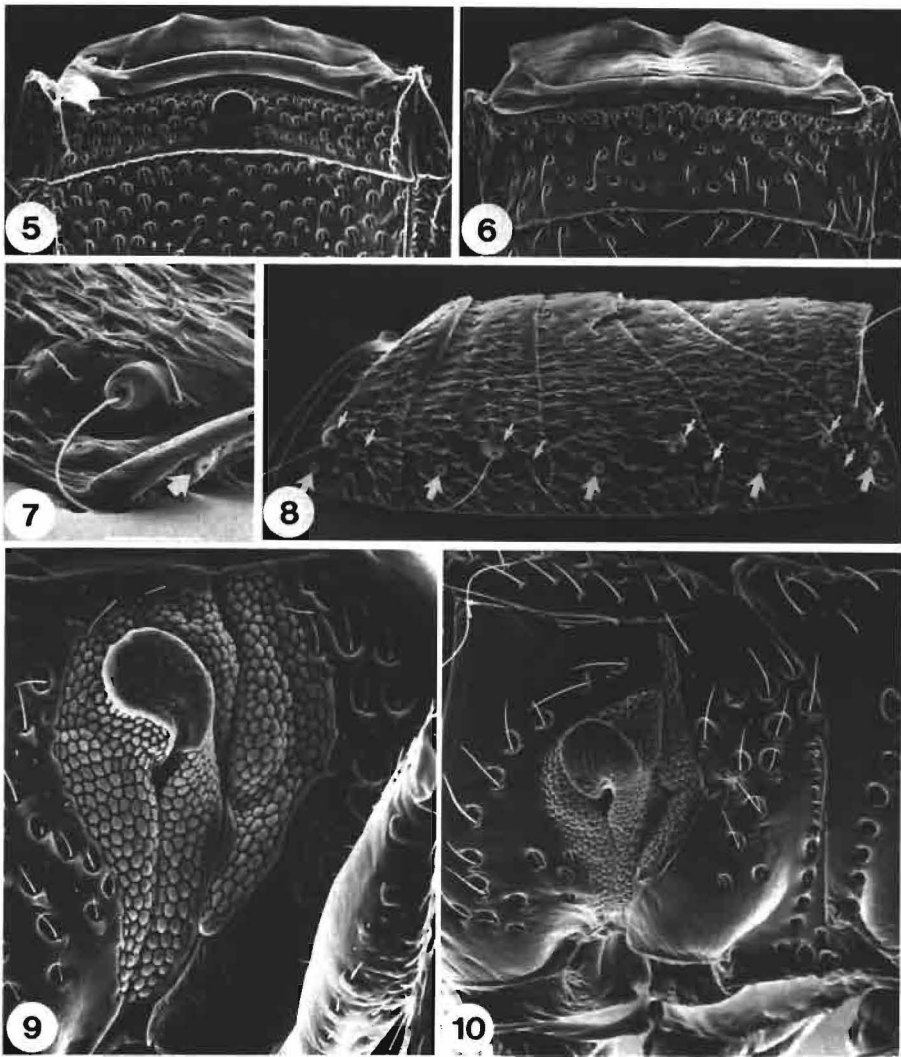
Diagnostic measurements are given in Table 1.

Diagnosis. Body stout, robust, nearly rectangular. Whole body covered with shortish, semi-decumbent setae which are adpressed to the body and originate from large punctures (Figs 1–3, 15). General colour of body and appendages brown-ochre and some specimens uniformly this colour except for the yellow-ochre posterior margins of the hemelytra and the darker intersegmental sulci on the abdominal nota. Most specimens with upper parts of head and abdomen, scutellum and large anterior lobe of pronotum reddish brown to dark reddish brown.

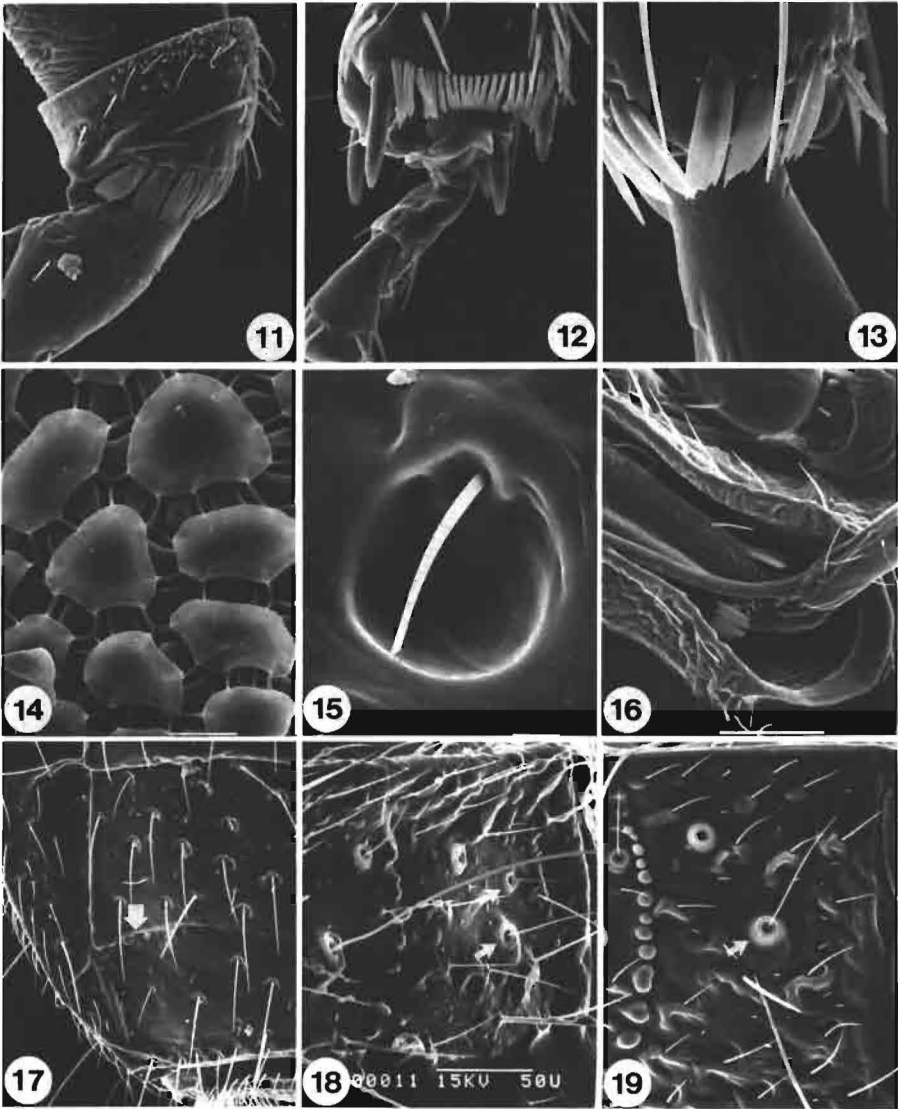
Head. About 1,1 times as wide as long, moderately declivent, slightly convex across vertex. Clypeus extending to apex of first antennal segment. Eyes small, protuberant, set close to the anterolateral pronotal extensions, consisting of about 28 large facets which give it a granular appearance. Ocelli absent. Antenniferous tubercles not visible from above. Antennae 5-segmented but no movement possible between segments two and three; relative lengths of segments 1 : 1 : 1,8 : 2,3 : 2,8. Rostral groove well developed, extending from the tip of the tylus where labium originates posteriorly for

TABLE 1. Measurements (in mm) of *Thaumastella elizabethae* spec. nov.

		Holo- type ♂	Allo- type ♀	N	Males			N	Fe- males		
					Mean	SD	Range		Mean	SD	Range
Total	length	1,897	2,097	10	1,954	0,096	1,827-2,111	10	2,071	0,081	1,910-2,210
	width	0,803	0,873	10	0,813	0,036	0,778-0,931	10	0,857	0,023	0,812-0,893
Head	length	0,371	0,392	10	0,396	0,028	0,359-0,459	10	0,402	0,028	0,374-0,469
	width (across eyes)	0,438	0,449	10	0,436	0,015	0,413-0,466	10	0,436	0,015	0,404-0,456
Pronotum	length	0,492	0,478	10	0,485	0,018	0,458-0,549	10	0,475	0,029	0,433-0,527
	width	0,714	0,723	10	0,718	0,037	0,642-0,804	10	0,726	0,028	0,651-0,780
Scutellum	length	0,308	0,321	10	0,322	0,022	0,280-0,371	10	0,309	0,020	0,274-0,342
	width	0,531	0,569	10	0,557	0,045	0,485-0,623	10	0,580	0,013	0,568-0,602
Antennal	I	0,114	0,128	10	0,117	0,011	0,101-0,142	10	0,116	0,007	0,101-0,130
segments	II	0,111	0,118	10	0,118	0,014	0,101-0,140	10	0,116	0,009	0,101-0,133
	III	0,214	0,213	10	0,219	0,014	0,190-0,240	10	0,208	0,006	0,195-0,221
	IV	0,265	0,265	10	0,268	0,016	0,234-0,291	10	0,268	0,011	0,245-0,289
	V	0,323	0,320	10	0,327	0,017	0,298-0,360	10	0,332	0,011	0,305-0,349



Figs 5–10. Scanning electron photomicrographs illustrating morphological features of *Thaumastella* species. 5–6. Dorsal view of first few abdominal tergites. 5. *T. elizabethae*. 6. *T. namaquensis*. 7. Lateral part of third (first visible) abdominal ventrite – arrow indicates spiracle 2 situated in the membranous front strip. 8. Lateral view of the abdominal venter of *T. elizabethae* showing the arrangement of the spiracles (large arrows) and trichobothria (small arrows). 9–10. Lateral view of the meso- and metathorax showing the scent gland opening and evaporative area. 9. *T. elizabethae*. 10. *T. namaquensis*.



about 4/5ths of the length of the underside of the head. Labium 4-segmented, first segment hidden in rostral groove, relative lengths of segments 1:1,1:0,9:1,1; tip only reaching to mid-coxae. Labrum well developed, reaching the apex of the first labial segment.

Thorax. Pronotum subrectangular, 1,5 times as wide as long; lateral margins sinuate; small posterior lobe slightly wider than large, somewhat tumescent, anterior lobe; anterolateral angles moderately produced anteriorly on either side of the head; posterior margin slightly concavely bisinuate. Scutellum about 1,75 times as wide as long, lateral margins concave in order to fit tight to the convex inner margins of the hemelytra. Metathoracic scent gland canal long, terminating in a moderately raised ostium close to the dorsal margin of the metapleuron; evaporative area large with a large part situated on mesopleuron (Fig. 9); sculpture of this area raised polygonal plates interconnected by a network of ridges (Fig. 14).

Legs. Coxae armed with a row of broad, scale-like, spines adpressed to surface of well developed trochanters (Fig. 11). Femurs somewhat incrassate but unarmed. Fore tibiae dilated towards apex with a few well developed, grooved spines and a tibial comb consisting of about 20 teeth at apex (Fig. 12). Tarsi 3-segmented, third segment about twice as long as other two which are subequal in length; third segment with two claws, each with an associated curved pulvillus.

Wings. Hemelytra reduced to trianguloid pads reaching nearly to intersegmental suture 3/4 of abdomen; lateral margins straight and parallel. Hind wings present as small trianguloid pads bearing a sclerotized strigil medially on the underside, no veins discernable (Figs 29, 35–36).

Abdomen. Dorsum. Oval, slightly wider than pronotum. First tergum large, weakly sclerotized except in region of metathoracic wings where it is somewhat more sclerotized; it bears a semi-oval, finely striated plectrum near its anterior margin (Figs 29–32). Second tergum represented by a well sclerotized, laterally widened, transverse ridge (Figs 5, 29). In latero-posterior areas of this sclerite 1 + 1 subcircular, very strongly sclerotized, blackish internal structures are discernable. Third tergum medially with a depressed semicircular area (Figs 5, 29). Terga 6 + 7 fused medially in females but intersegmental suture is clearly visible laterally on mediotergite and on laterotergites; in males fusion more complete and intersegmental suture sometimes totally indiscernable although some variation exists and it is often recognizable laterally on the mediotergite.

Venter. All intersegmental sutures reaching lateral margin. Intersegmental suture 6/7 medially produced anteriorly in males becoming V-shaped (Fig. 2); in females it is evenly rounded. Spiracles 2–7 ventral, spiracle 2 situated in membranous front

Figs 11–19. Scanning electron photomicrographs illustrating morphological features of *Thaumastella* species. 11. Apex of a coxa showing the scale-like setae. 12. Apex of the fore tibiae showing the tibial comb and grooved spines. 13. Apex of the first antennal segment showing the scale-like spines. 14. The evaporative area (scale bar = 5 μ m). 15. A puncture on an abdominal tergum with associated seta (scale bar = 5 μ m). 16. The rostral groove on the underside of the head showing the scale-like spines at the apex of the first labial segment (scale bar = 50 μ m). 17. Posterolateral part of abdominal dorsum of *T. namaquensis* showing suture 6/7 (arrow). 18–19. Lateral aspect of abdominal segments six and seven showing the trichobothria. 18. *T. namaquensis*. Arrows indicate two trichobothria on segment seven. 19. *T. elizabethae*. Arrow indicates only trichobothrium of segment seven.

strip of sternite two (Fig. 7), not visible exteriorly. All trichobothria postspiracular; 1+1 present on sternite 7; 2+2 on sternites 3–6, situated diagonally – the larger one more anteromedial of the smaller one (Fig. 8).

External genitalia. MALE. Pygophore with two dorsolateral patches of squamiform setae (Fig. 20). The parameres (Figs 22–23, 28) characterized by having a tuft of extremely long setae (consisting of about ten setae) laterally.

FEMALE (Fig. 25). Similar to those of *T. aradoides* as figured by Stys (1964), Seidenstücker (1960) and Dolling (1981). Spermatheca (Fig. 26) mushroom-shaped; proximal flange very weakly developed and distal flange not discernable; sclerotized part of duct straight.

Chromosome number: 2n (♂) = 20XY (16A+2m+XY)

Discussion. *T. elizabethae* is closely related to *T. namaquensis* with which it shares brachyptery and the lack of ocelli. It can, however, be distinguished by several distinct characters: The males are recognized by the presence of the 1+1 patches of squamiform setae dorsolaterally on the pygophore and the presence of the tufts of long setae on the parameres (Fig. 20). Both sexes can be distinguished by: 1. The presence of a semicircular impression medially on tergum 3 (compare Figs 5 and 6). 2. The long metathoracic scent gland canal which opens near the dorsal margin of the metapleuron and the larger evaporative area than in *T. namaquensis*. In the latter the scent gland canal is shorter, opening about halfway between the coxae and dorsal margin of the pleuron (compare Figs 9 and 10). 3. The shorter rostrum which reaches only to the mid coxae while it reaches the hind coxae in *T. namaquensis*. 4. The shorter body setae which are more adpressed to the body (compare Figs 3, 5, 20 with 4, 6, 21). 5. The body form which is more compact and stout in *T. elizabethae*, especially the pronotum and abdominal terga which are wider and shorter (compare Figs 3 and 4).

Derivation of the specific epithet: this species is dedicated to Elizabeth Janse van Rensburg who accompanied me on the collecting trip when it was first collected.

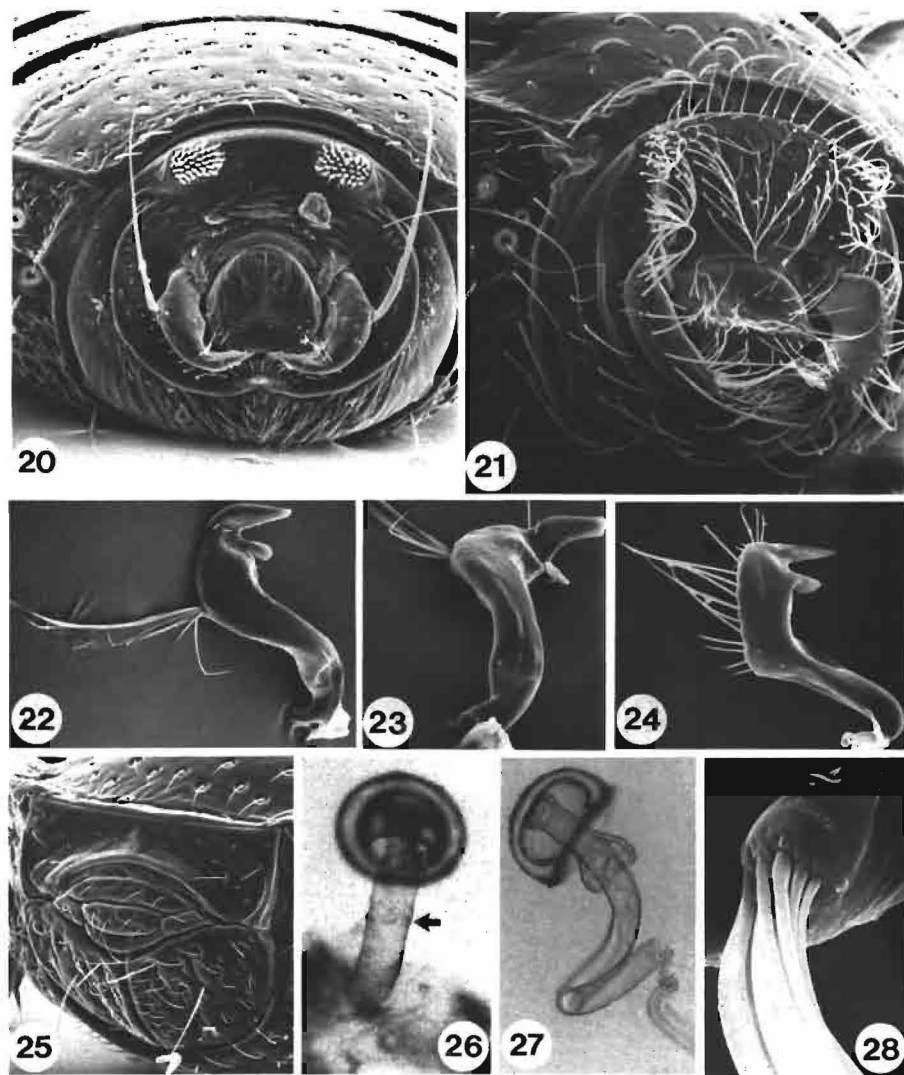
MATERIAL EXAMINED: SOUTH AFRICA, Namaqualand. ♂ Holotype: Farm Wiedouw, nr. Vanrhynsdorp, 31°44' S 18°46' E, 7–9.ix.1986, D. H. Jacobs (TMSA); ♀ allotype: ditto (TMSA); 20♂♂ 37♀♀ paratypes: ditto (2♀♀ AMGS, 2♂♂ 3♀♀ AMNH, 1♂ 2♀♀ BMSA, 2♂♂ 3♀♀ BMNH, 2♂♂ 3♀♀ CASC, 2♂♂ 2♀♀ DHJS, 1♂ 2♀♀ NMSA, 2♂♂ 3♀♀ MRAC, 8♂♂ 17♀♀ TMSA); 5♂♂ 10♀♀ paratypes: same data but 18–21.ix.1984 (TMSA).

MORPHOLOGY

The morphological study is based on numerous specimens including some from the type series of both species. The morphology of the Thaumastellidae has been discussed in some detail by Seidenstücker (1960, 1964), Stys (1964) and Schaefer & Wilcox (1971), but a few aspects justify attention especially where my observations differ from those of some of these authors.

The stridulatory mechanism

Seidenstücker (1960) and Stys (1964) described and figured the stridulatory apparatus in *T. aradoides*. In this species a stridulitrum containing about 44 teeth is present on the underside of the hind wing near its base. The plectra, according to these authors, are the 1+1 strongly sclerotized areas situated laterally on the ridge formed by tergum 2. These 'limae' are irregularly striated (Stys 1964).



Figs 20–28. Scanning electron photomicrographs of the external genitalia and photomicrographs of the spermathecae of *Thaumastella* species. 20–21. Pygophore, posterior view. 20. *T. elizabethae*. 21. *T. namaquensis*. 22–23. Different aspects of the right paramere of *T. elizabethae*. 24. Left paramere of *T. namaquensis*. 25. External genitalia of female *T. elizabethae*, posterolateral view. 26–27. Spermathecae. 26. *T. elizabethae*. Arrow indicates weakly developed proximal flange. 27. *T. namaquensis*. 28. Attachment site of tuft of long setae to paramere of *T. elizabethae*.

In the case of the brachypterous *T. namaquensis* Schaefer & Wilcox (1971) and Schaefer (1980) incorrectly assumed that the hind wings are absent, and that the stridulitrum therefore is situated on the hemelytra or possibly on the third abdominal tergum. They also considered the 'limae' to be the plectra. Examination of both brachypterous species has shown that the hind wings are present although they are reduced to small subtriangular pads which are hidden under the hemelytra (Figs 29, 33). No veins are present on the hind wings except for a well sclerotized, longitudinal ridge medially on the underside which bears a well developed stridulitrum (Figs 35–38). The stridulitrum of *T. namaquensis* (Figs 37–38) is usually between 98 and 105 μm long and consists of 29–37 teeth which are between 2.8 and 3.2 μm apart over most of its length (at the two extremes the distances between teeth tend to vary). In one specimen the stridulitrum was found to be about 87 μm long with 34 teeth about 2.4 μm apart. The only stridulitrum measured of *T. elizabethae* (Figs 35–36) was 110 μm long, with 23 teeth about 4.0 μm apart. *In situ* these stridulitra are situated above the first abdominal tergum well removed (anteromedially) from the 'limae' (Figs 29, 33). The plectrum is an extremely finely transversely ridged sub-oval area situated near the anterolateral margin of tergum one (Figs 30–32, 34). The ridges are very regular and about 0.8 μm apart in both species. The 'limae' in these species proved to be internal structures which are exteriorly indistinguishable from the sclerotized ridge of tergum two (Figs 5–6).

Schaefer & Wilcox (1971) also described and figured 'an oval area of fine striae at the posterolateral corner' of what they considered to be tergum two. I could not find any such area at the described location. Their Fig. 3 is also not reminiscent of the true situation except if it is rotated through 180° so that the striated area is at the anterolateral margin of the tergum.

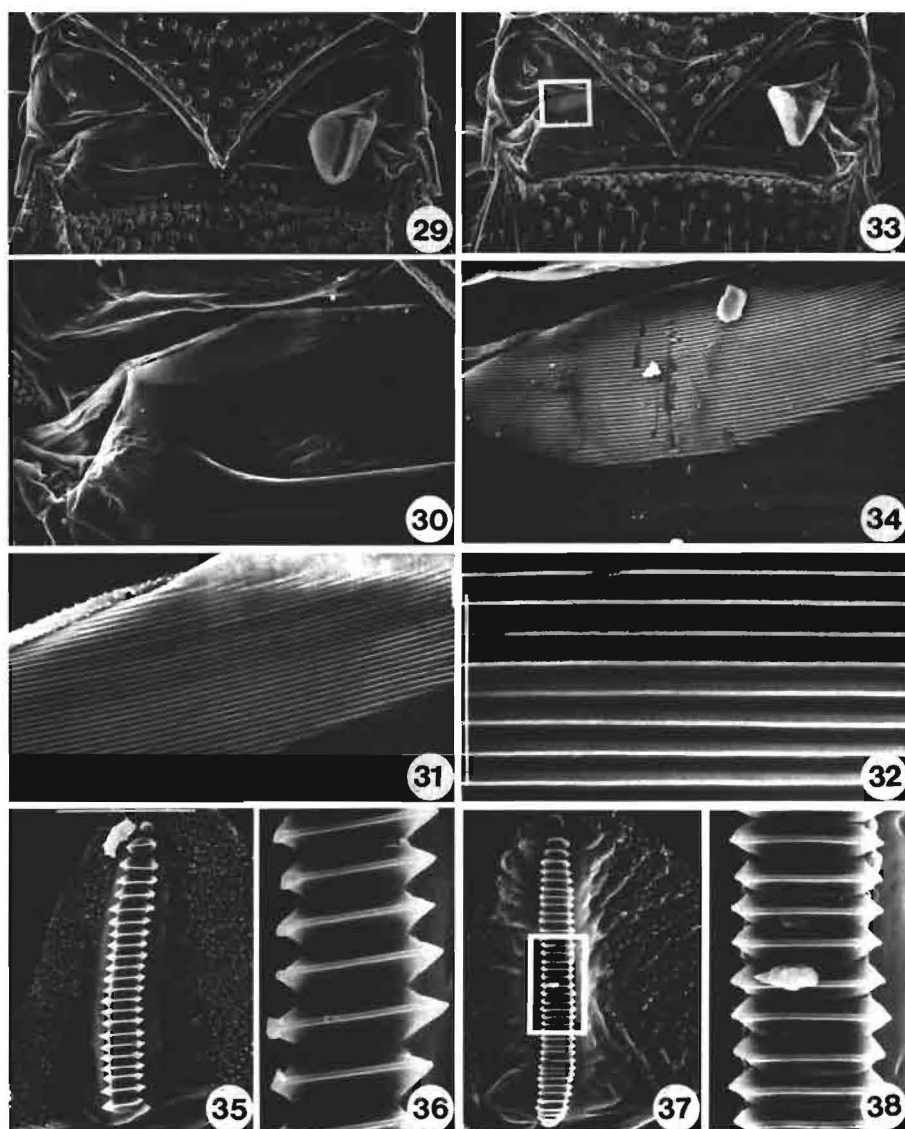
The stridulatory mechanism in these thaumastellids is thus similar to that in the Cydnidae (Leston 1954, 1957; Schaefer 1980; Lawson & Chu 1971) and is probably a plesiomorphic character that they share with various other pentatomoid groups.

No material of *T. aradoides* was available for study but the situation there should be re-examined as it is doubtful whether an irregularly striated 'lima' could be an effective plectrum.

Trichobothria (Figs 8, 18–19)

In both species from South Africa 2 + 2 trichobothria are present laterally on ventrites 3–6 (and not 2–6 as stated in Stys 1964) in oblique rows. The row on ventrite 3 is nearly longitudinal but subsequent rows become more oblique until the row on ventrite 6 is nearly transverse (Fig. 8). On ventrite 7 there is only 1 + 1 trichobothria (corresponding with the larger anteromedial trichobothria of the other ventrites) present in *T. elizabethae* (Fig. 19). Contrary to the view of Schaefer (1975) there are 2 + 2 trichobothria present on ventrite 7 of *T. namaquensis*, a large one situated posteromedially

Figs 29–38. Scanning electron photomicrographs of the stridulatory apparatus of *Thaumastella* species. 29. Dorsal view of *T. elizabethae* with both hemelytra and left metathoracic wing removed. 30–32. Plectrum of *T. elizabethae* under different magnifications (scale bars = 5 μm). 33. Dorsal view of *T. namaquensis* with both hemelytra and left metathoracic wing removed. 34. Plectrum of *T. namaquensis*. 35–36. Stridulitrum of *T. elizabethae*. 35. Whole structure (scale bar = 50 μm). 36. Part, showing individual teeth. 37–38. Stridulitrum of *T. namaquensis*. 37. Whole structure. 38. Enlargement of indicated part in Fig. 37.



of the spiracle and a small one lateroposteriad of the former (Figs 18, 21). The number and arrangement of the trichobothria in this species are thus similar to those in many Cydnidae.

Fusion of terga 6 and 7 (Figs 1, 3-4, 17)

In this character there seems to be some variation as well as differences between the sexes of both species. Schaefer & Wilcox (1971) could find no indication of tergal suture 6/7 in *T. namaquensis* although they show the suture on the laterotergites in their Fig. 2. I found that the suture could be recognized laterally on the mediotergite and on the laterotergites in most specimens of both species (Figs 3, 17, 20, 21). In *T. elizabethae* the suture is usually better developed and more visible in the females.

Spermatheca (Figs 26-27)

The spermathecae of the two southern African species differ markedly from that of *T. aradoides* as described and figured by Stys (1964). In both the sperm bulb is flattened and shaped like a droopy mushroom. In *T. namaquensis* the proximal flange is well developed and the sclerotized part of the duct is crooked (Fig. 27). In *T. elizabethae* the proximal flange is hardly recognizable and the sclerotized part of the duct is straight (Fig. 26).

Scale-like spines (Figs 11, 13, 16)

In both species scale-like spines are present on the apices of the coxae, as described for *T. aradoides* by Dolling (1981). In addition similar spines are also present at the apices of the first antennal segment (Fig. 13) and the first labial segment (Fig. 16).

Punctures of the cuticle (Figs 5-6, 15, 17)

Seidenstücker (1960) described and figured the punctures of *T. aradoides*. According to him and Stys (1964) they are provided with several pores. Although light microscopic observations on *T. namaquensis* and *T. elizabethae* somewhat resembled the above, SEM observations of well cleaned specimens showed that the punctures consist of a single large bowl-shaped depression and that the associated seta usually originates from a small impression set on the anterior margin of the large depression (Fig. 15). It seems that dirt or a secretion is usually present in the large punctures which gives them a multipore appearance under the light microscope.

Abdominal scent gland openings

Although no indication exists in the adults of *T. namaquensis* of dorsal abdominal scent gland openings (Schaefer & Wilcox 1971), nymphs collected have three well developed dorsal abdominal scent gland openings: a short slitlike one between terga 3/4 and two long slitlike openings between terga 4/5 and 5/6 respectively.

Chromosome number

The chromosome numbers of both southern African species were determined. *T. elizabethae* has $2n (\delta) = 20 (16A + 2m + XY)$ while two numbers were found in *T. namaquensis* namely $2n (\delta) = 18 (14A + 2m + XY)$ in a population on the farm Deurdrift near Springbok ($29^{\circ}41' S$ $17^{\circ}56' E$) and $2n (\delta) = 17 (12A + 2m + \text{presumably } X_1X_2Y)$ in a population at Spektakelberg Pass ($29^{\circ}42' S$, $17^{\circ}42' E$). The cytogenetics of the two species will be discussed in more detail in a separate paper (Jacobs, in prep.).

The most outstanding feature is the presence of m-chromosomes which, except for a doubtful case in *Scolinophara* reported by Jande (1960), is unique in the Pentatomidea. In the latter case the behaviour and properties of the so-called m-chromosomes is not typical and they were not observed in the other species of the same or related genera (Ueshima 1979).

HABITAT and BIOLOGY

Schaefer & Wilcox (1971) discussed in some detail the habitat at Springbok where most of my specimens of *T. namaquensis* were collected. I visited Springbok three times to collect specimens: September 1984, April 1985 and September 1986. Most of the specimens were collected under fairly large stones in cavities which are exposed when the stones are removed. Single specimens were also collected on the ground near the stones, especially at dusk, but individuals of *T. namaquensis* seemed reluctant to leave their sheltered environment. Even night visits to the spots where they were abundant produced no individuals above-ground. It is possible that they live on seeds that are accumulated by the wind against the stones and very seldom leave their shelters. The species was found to be common at certain spots and I have returned repeatedly in subsequent years to the same spots and always found them present. Although they were found at scattered spots they seemed to be especially abundant where a few suitable stones were present in or near old or existing sheep and goat kraals. The reason for this is not clear as, for example, different species of plants were present in the kraals where I collected them at the farm Deurdrift near Springbok and Spektakelberg Pass about 30 km west of Springbok. It is possible that the manure and moisture supplied by the sheep and goats could maintain better seed-producing vegetation in this arid region to the advantage of the bugs which are almost certainly seed-eating.

Although August and September is the time of year when most of the plants of this winter rainfall area produce flowers and seeds, thaumastellid nymphs were only found during April. Nymphs of all stages were found together with the adults.

A few specimens of *T. elizabethae* were originally collected in September 1984 under a large stone at the foot of the Gifberg mountain (31°44' S, 18°46' E) near Vanrhynsdorp in southern Namaqualand. During April 1984 no specimens were found at the same spot. In September 1986 many specimens were collected in the late afternoon while feeding on fallen seeds of *Pharnaceum aurantium* (DC) Druce (Aizoaceae) which grow on an embankment at the edge of a cultivated field. Under nearby stones many more specimens were present. The small seeds of *P. aurantium* are hard and discus-shaped with a diameter of about 0.6–0.7 mm. The stylets of *T. elizabethae* could only penetrate the seed at its edge and probably with difficulty. Many specimens were seen walking with a seed still attached to their stylets so that the seed was dragged at the side of the thorax. Even when disturbed they seem unable to free their stylets quickly and ran with the seeds still attached to them. Some specimens were observed entering small holes some distance away from any visible stones.

DISTRIBUTION

Apart from the specimens I collected, several specimens of *T. namaquensis* were also found in the Transvaal Museum collection. These records extend its range to the Richtersveld (north-western Cape Province) and the central parts of Namibia. The known distribution of the two species is shown in Fig. 39.

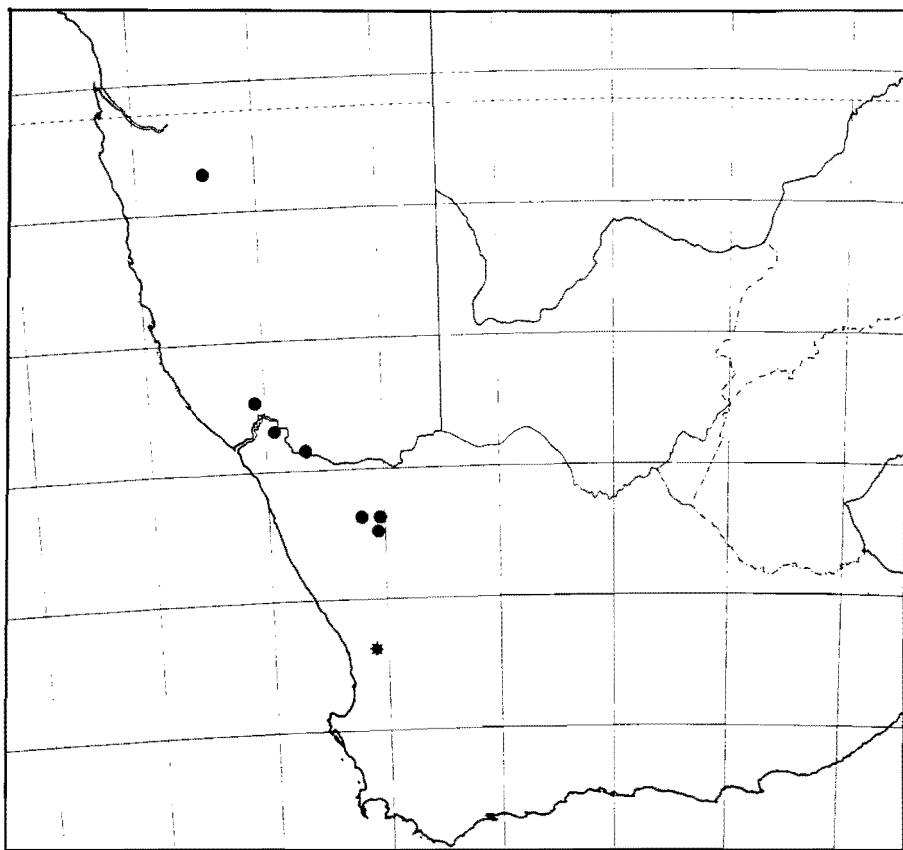


Fig. 39. Distribution map of *Thaumastella* species of southern Africa. *T. elizabethae*, star; *T. namaquensis*, solid circles.

SYSTEMATIC POSITION OF THAUMASTEELLA

Both Stys (1964) and Dolling (1981) have pointed to the relationship between *Thaumastella* and the Cydnidae. Dolling proposed it to be the sistergroup of the rest of the Cydnidae and relegated it to a subfamily of that family.

This study has shown that many of the characteristics believed to be unique to *Thaumastella* (e.g., the number and distribution of the trichobothria and the stridulatory apparatus) were probably incorrectly described and do also occur in the Cydnidae. Even the division of the corium into an exo- and endocorium is not unique in the Trichophora as Stys (1964) alleged, but also occurs in *Blaena* (Cydninae) e.g. *Blaena setosa* as figured by Froeschner (1960). The genus *Peltoxys*, especially *P. thaumastellus* Linnavuori (1977),

seems to be intermediate between the Cydninae and *Thaumastella*. Unfortunately Dolling (1981) didn't discuss these two genera in his proposed classification of the Cydnidae.

The presence of m-chromosomes and certain features of the male genitalia of *Thaumastella* still seem to be unique within the Pentatomoidea but when information on more species, especially of the above-mentioned genera, become available these features may also prove not to be exclusive to *Thaumastella*.

To my mind the final rank and position of *Thaumastella* can only be determined after a complete and intensive re-evaluation of the whole Cydnidae. Whether it is treated as a family, as do most heteropterists, or a subfamily as proposed by Dolling is a question of personal taste as both are reconcilable with the present hypothesis that *Thaumastella* is the sistergroup of the rest of the Cydnidae.

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